Manitoba

Annual Report 1990 - 91

Energy and Mines

Recycled Paper

This publication is available
in large print, audiotape or
braille on request.

Manitoba

Annual Report 1990 - 91

Energy and Mines

91-07001/

Minister of
Energy and Mines
Minister Responsible for Manitoba Hydro

Room 301
Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

The Honourable George Johnson
Lieutenant-Governor of the Province of Manitoba

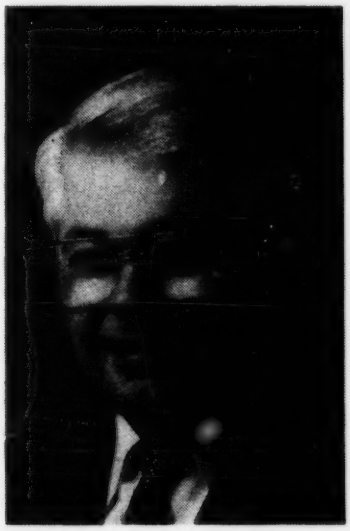
May it please your Honour:

I have the honour of presenting to you the Annual Report of the Department of Energy and Mines for the fiscal year ending March 31, 1991.

This report records the activities of the operating and support service divisions of the Department during the year.

Respectfully ,

Harold Neufeld
Minister



Manitoba

Deputy Minister of
Energy and Mines

Room 309
Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

(204) 945-3130

The Honourable Harold Neufeld
Minister of Energy and Mines

Dear Sir:

I have the honour to present the Annual Report of the Department of Energy and Mines for the fiscal year ending March 31, 1991. The report contains a descriptive and statistical record of activities and achievements in the Department during the year.

Respectfully submitted,

Ian Haugh
Deputy Minister

Table of Contents

TITLE	PAGE
Department of Energy and Mines	9
Introduction	9
Organization Chart	10
Statutory Responsibilities	11
Administration and Finance	12
Executive Branch	12
Administrative Services Division	13
Financial Services	13
Personnel Services	13
Computer Services	14
Library Services	14
Energy Division	15
Energy Administration	16
Energy Planning Branch	16
Energy Programs (Buildings) Branch	17
Programs	17
Public Information	18
Projects	19
Energy Programs (Transportation) Branch	19
Petroleum Branch	21
Administration Section	21
Geology Section	22
Engineering and Inspection Section	23
Oil and Natural Gas Conservation Board	24

TITLE	PAGE
Minerals Division	25
Mineral Development Section	26
Mines Branch	26
Mining Recording	26
Mineral Dispositions in Good Standing at Calendar Year End 1987-1990	27
Mineral Dispositions Issued Each Calendar Year 1987-1990	28
Mining Engineering	29
Aggregate Resources	29
Geological Services Branch	30
Location of Field Projects 1990/91	33
Appendix A - Financial Information	35
Table 1 Energy and Mines Expenditure Summary for year ended March 31, 1991	36
Table 2 Energy and Mines Revenue Summary by Source for year ended March 31, 1991	38
Table 3 Energy and Mines Other Revenue Collected by the Province for year ended March 31, 1991	40
Table 4 Energy and Mines Five Year Expenditure and Staffing Summary by Appropriation ($000) for years ending March 31, 1987 to March 31, 1991	40
Appendix B	41
Departmental Publications	42
Departmental Directory	48

Department of Energy and Mines

Introduction

Serving Manitoba

The Department of Energy and Mines comprises an energy component and a minerals component, each with its own distinct set of goals, and each making a substantial contribution to the sustainable development of the Province.

The energy component, through the Energy Division has two clear goals: to ensure that there is a secure supply of energy available to Manitobans at a reasonable cost; and to foster and encourage the wise use of energy through the promotion of energy efficiency and conservation. We can report success in these areas. Manitoba's energy end use demand has remained relatively constant between 1979 and 1989, despite real domestic product growing at an average annual rate of 3%. Over this same period, energy consumption on a per capita basis has declined by about 9%.

The goal of the mineral component is to encourage, promote and facilitate the exploration, development and production of minerals in the Province, including oil and gas, consistent with the principles of sustainable development.

The contribution of the mineral industry to the Province is substantial. Over the last five years the total value of mineral production in Manitoba has averaged $1.3 billion per year. In 1990 the total value of all mineral production (industrial, metallic minerals and crude oil) was $1.36 billion, including 737,800 cubic metres of crude oil valued at $155 million, and a value of $1.214 billion for industrial and metallic minerals.

Two important draft sustainable development strategies were developed by the department during the year: a Minerals Strategy and an Energy Strategy. Workbooks setting out these strategies were released on February 21, 1991 (Minerals) and November 27, 1990 (Energy) and workshops conducted at several locations throughout the Province.

The Minister of Energy and Mines was host of the 47th Annual Mines Ministers Conference and the Council of Energy Ministers Annual Meeting. These took place on August 26 to 29, 1990 in Winnipeg and were attended by delegates from governments and mining industry.

Structure of the Annual Report

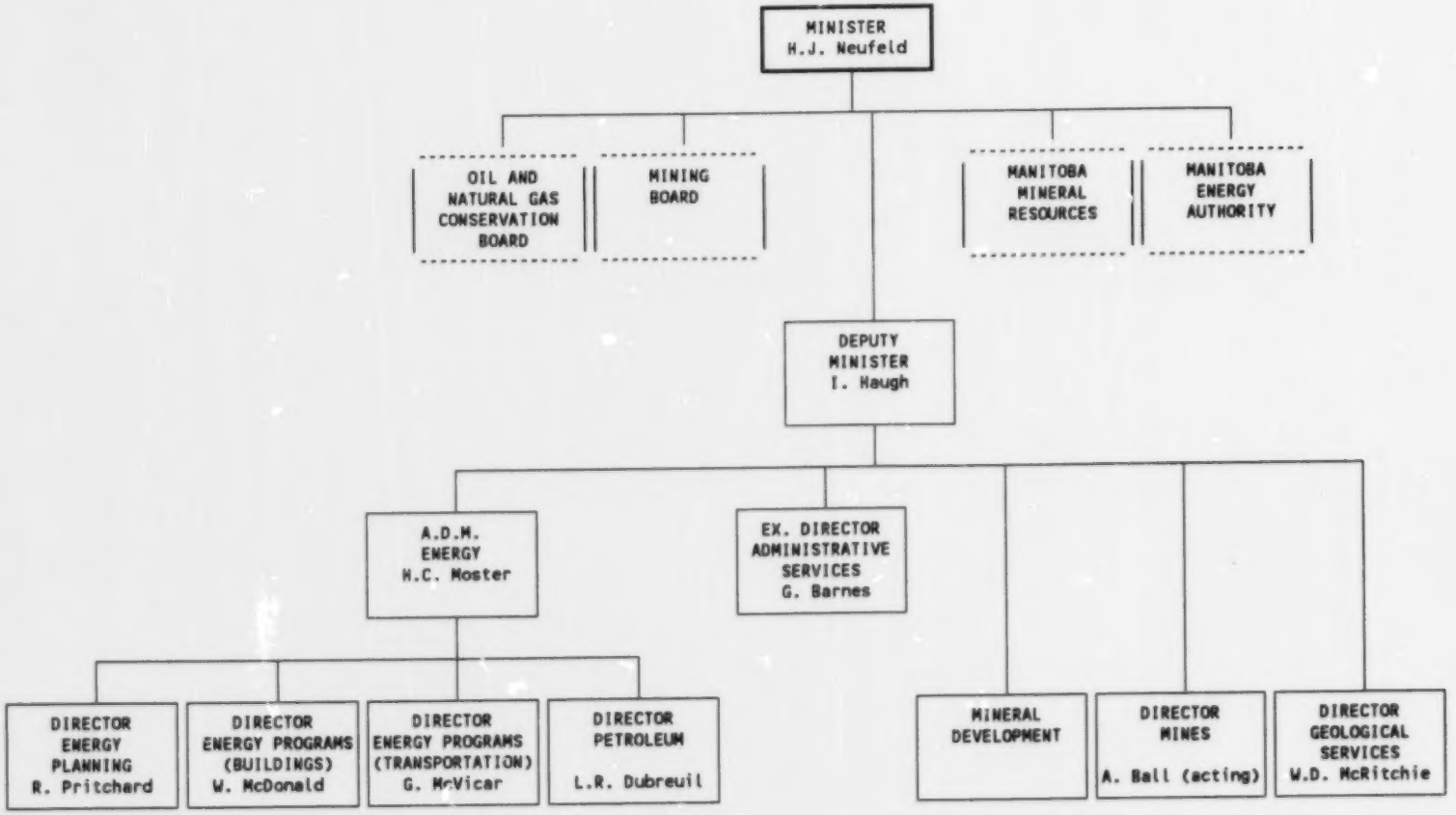
- The Annual Report is organized in the same sequence as the department's appropriation structure of the Main Estimates of Expenditure for the Province.
- The Report sets out the objectives and achievements of each of the department's branches during the 1990/91 fiscal year under the main appropriation headings of - Administration and Finance, Energy and Minerals (but excluding the Manitoba Energy Authority which produces its own annual report). Expenditure information for each sub-appropriation is included after the narrative for each branch.
- Appendix A to the Report comprises a Financial Information section which summarizes: (a) the department's expenditures; (b) revenues for 1990/91 collected by the department; (c) mining revenues collected by the Department of Finance, and; (d) an Historical Information Table showing expenditures and staffing for the last five years.
- The last section of the Report is a Departmental Directory that conveniently lists departmental staff and telephone numbers. This section also includes a list of reports and maps produced by the department during the year.

Previous annual reports included narrative and statistical information regarding the performance of Manitoba's mining and petroleum industries. In future we will report this information in separate annual activity reports. Detailed information on the activities of the Geological Services Branch will continue to be provided in the annual Report of Activities.

Organization Chart - Manitoba Energy and Mines

MANITOBA ENERGY AND MINES DEPARTMENTAL OVERVIEW

as at March 31, 1991



Statutory Responsibilities

The Minister of Energy and Mines is responsible for the following statutes.

	Continuing Consolidation Chapter
The Manitoba Energy Authority Act	E112
The Manitoba Energy Council Act	E 113
The Gas Pipe Line Act	G 50
The Gas Storage and Allocation Act	G52
The Greater Winnipeg Gas Distribution Act (SM 1988, c. 40)	
The Homeowners Tax and Insulation Assistance Act (Part V together with Section 1 and Part VI as they relate to subjects covered under Part V)	H 75
The Industrial Minerals Drilling Act	I 20
The Mineral Exploration Assistance Act	M 140
The Mines Act	M 160
The Mining and Metallurgy Compensation Act	M 190
The Natural Gas Supply Act	N 15
The Manitoba Natural Resources Development Act (as it applies to Manitoba Mineral Resources Ltd.)	N 33
The Oil and Gas Production Tax Act	O 37
The Pipe Line Act	P70

The Minister of Energy and Mines, is also responsible for the following Crown corporations and boards.

Manitoba Hydro
Manitoba Mineral Resources Ltd.
The Mining Board
The Oil and Natural Gas Conservation Board
Manitoba Energy Authority

Manitoba Hydro, Manitoba Mineral Resources Ltd., and the Manitoba Energy Authority produce their own annual reports.

Administration and Finance

Administration and Finance comprises the Executive Branch and the Administrative Services Division.

Executive Branch

The Executive Branch includes the Offices of the Minister and Deputy Minister of Energy and Mines. This branch provides for the overall planning and policy direction of the department, and coordinates departmental activities. In 1990/91, a Conawapa Project Coordination group was added to provide overall coordination of the Conawapa Hydroelectric Project among provincial government departments, Manitoba Hydro and the federal government.

Expenditures by Sub-Appropriation

23-1A & 1B Executive Branch	Actual 1990/91 $	Estimate 1990/91 SY	Estimate 1990/91 $	Variance Over(Under)
Total Salaries	356,400	9.00	345,700	10,700
Total Other Expenditures	161,900		151,100	10,800
Total Expenditures	518,300	9.00	496,800	21,500

ADMINISTRATIVE SERVICES DIVISION

Administrative Services provides a comprehensive range of support services to the entire department. These include financial and accounting services, personnel management, computer systems support, library services, and administrative policy development. In providing these specialized services, the Administrative Services Division helps the rest of the department to fulfil its program goals.

Financial Services

The Financial Services Section provides a broad range of financial, accounting, budgetary, and operational support services to the department. Principal among these are:

- financial planning and coordination of the departmental annual revenue and expenditure estimates;
- financial advice to program managers;
- financial reporting and expenditure control;
- voucher processing and disbursement;
- revenue accounting;
- co-ordination of requests for departmental goods and services including office accommodation and equipment; and
- co-ordination of departmental vehicle usage and maintenance and administration of the parking program.

The Financial Services Section is committed to the departmental goal of constantly improving its service to its various client groups and will continue to pursue that goal through improved quality of the service offered to branches in the department. In addition we will pursue the following initiatives in 1991/92: continue to play an advisory role in the review of the Mining Recording and Geological Services Inventory Systems; continue to work with Government Services to identify space requirements for branches that are moving under the decentralization program; and undertake a review of the commitment and financial reporting system in the department with a view to improving the efficiency of the system.

Personnel Services

The Personnel Services Section provides human resource management services to the department, including:

- position classification;
- recruitment and selection;
- employee relations;
- training and development;
- payroll and benefits administration;
- affirmative action coordination; and
- French Language Services coordination.

In 1990/91, the Personnel Services Section recruited staff to fill 31 positions (excluding casual and summer student positions); and also completed formal classification reviews on 24 positions. The Section continued the application of Affirmative Action policies. Target group membership remained fairly constant in the female, visible minority and disabled categories, but there was a decrease in the native category.

The section continued to play a key role in the implementation of the department's decentralization initiatives and departmental reorganization. Accomplishments over the past year included a review of internal procedures and systems, and the implementation of a number of measures to streamline processes and personnel/payroll related activities. A review of the Personnel Management Information System resulted in more efficient and faster reports being produced. We also assumed the coordination of summer student recruitment and placement for the department's geological field program.

Staff will continue to participate in the training and certification program towards delegated classification authority, including the review of classification series unique to the department. Other initiatives will include the review of our orientation program for new employees, and the promotion of the department's performance management program, particularly as a communication and planning tool. In addition, we will assist the departmental Affirmative Action Committee with the education of staff and in the development of initiatives to advance the principles of Affirmative Action within the department.

Computer Services

The Computer Services Section provides the department with data processing and word processing support services, including:

- equipment evaluation and acquisition;
- user education and assistance;
- computer systems design and implementation;
- liaison between the department and other government agencies; and
- maintenance of the main word processing equipment.

The section is currently developing the Mining Recording Work Commitment System, Geographic Information System and Assessment File Index System for the Minerals Division.

We completed a major study of the work flow and procedures in the Mining Recording Offices in both Winnipeg and The Pas. As a result of the study, changes will be implemented to streamline and standardize the two offices.

We have scheduled the development of four new systems for 1991/92: an accounting system for the Mines Branch; a Crown Royalty and Production Tax System; a Crown Mineral Rights System and a Quarrying System.

Library Services

The department's library is a resource centre that provides research and reference services to departmental staff.

In 1990/91 the library made 394 loans as well as 461 interlibrary loans. The library added 2,719 books, reports, maps, and periodicals to its collection.

Expenditures by Sub-Appropriation

23-1C Administrative Services	Actual 1990/91 $	Estimate 1990/91 SY	Estimate 1990/91 $	Variance Over(Under)
Total Salaries	621,300	18.26	668,700	(47,400)
Total Other Expenditures	656,300		542,900	113,400
Total Expenditures	1,277,600	18.26	1,211,600	66,000

ENERGY DIVISION

Energy is essential to our way of life. Each year Manitobans spend over $2 billion to heat and light their homes, to power business, industry and agriculture, and to fuel their transportation needs. Energy expenditures represent 11.2% of the provincial gross domestic product.

Manitoba is a net importer of energy. While we are a net exporter of electricity, all of the natural gas and refined petroleum products used in the province are imported from Western Canada. Because there are no refineries in Manitoba, all of the crude oil produced in the province is exported to refineries in Ontario and the United States. Crude oil production exceeds 2000 cubic metres per day and is equivalent to 30% of the province's petroleum requirements. More than 70% of our energy demand is met by imported natural gas and refined petroleum products. The installed electrical generating capacity in Manitoba is 4,420 megawatts.

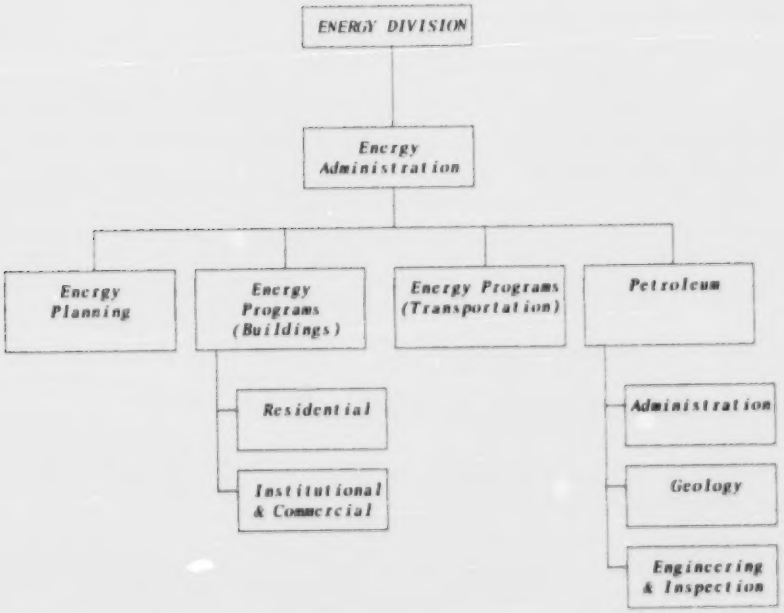
Anyone wishing to obtain detailed information on the Manitoba energy sector or the petroleum industry, is encouraged to contact the department's Energy Information Centre and ask for "Energy in Manitoba" and the "1990 Oil Activity Review".

The primary goals of the Energy Division are:

1. to ensure a secure supply of energy at a reasonable cost and to promote the efficient use and conservation of energy;
2. to encourage alternative fuels and transportation modes which protect the environment and reduce dependence on energy resources imported by the province; and
3. to encourage the exploration, development, and production of the province's petroleum resources in a way that provides maximum benefits to Manitoba with due regard to protection of the environment.

Energy Division Organization

The Energy Division is made up of the Assistant Deputy Minister's office, the Energy Information Centre and four branches; Energy Planning, Energy Programs (Buildings), Energy Programs (Transportation) and Petroleum. The director of each branch reports to the Assistant Deputy Minister who gives overall direction for programs related to the development and management of energy resources.



Energy Administration

Energy Administration comprises the Assistant Deputy Minister's office and the Energy Information Centre.

The Energy Information Centre provides information to the general public on programs, initiatives, audio-visual aids, and publications related to energy resources and energy management in Manitoba. During the 1990/91 fiscal year, the Centre responded to 11,389 energy related enquiries.

The Centre also provides support to the rest of the Energy Division in the preparation of information materials and organizing special events. Centre staff played a key role in assisting with Energy Awareness week, the Council of Energy Ministers Annual Meeting and the Sustainable Development Energy Strategy public workshops.

During the Persian Gulf Crisis, the Energy Information Centre was Manitoba's source of information on oil contingency planning.

Expenditures by Sub-Appropriation

23-2A Energy Administration	Actual 1990/91 $	Estimate 1990/91 SY	Estimate 1990/91 $	Variance Over(Under)
Total Salaries	206,000	6.00	227,800	(21,800)
Total Other Expenditures	76,900		83,000	(6,100)
Total Expenditures	282,900	6.00	310,800	(27,900)

Energy Planning Branch

The Energy Planning Branch collects and analyzes energy information relative to Manitoba's energy requirements. Branch staff uses the research and data collection to assess the impact of national and international energy developments and suggest a strategy for Manitoba to ensure a secure energy supply at a reasonable cost.

Activities and accomplishments of the Energy Planning Branch include:

- monitoring and providing advice to senior management on natural gas and electricity matters before the Public Utilities Board;
- monitoring and providing advice to department officials on the TransCanada Pipelines facilities expansion application to the National Energy Board;
- examining the petroleum royalty/tax regime with respect to petroleum exploration and development;
- taking the lead in agenda planning and the preparation of discussion material for the Council of Energy Ministers Annual meeting hosted by Manitoba in August, 1990;
- preparing and taking to the public the draft Sustainable Development Energy Strategy as well as participating in the development of a draft Sustainable Development Market Incentives and Fiscal Policy;
- studying and advising senior department officials as to the impact of the Federal Goods and Services Tax on energy costs to Manitobans;
- participating in the development of a contingency plan for meeting a petroleum shortage.

Other initiatives to be undertaken during 1991/92 include:

- drafting a Manitoba Energy Act, at the same time as the Sustainable Development Energy Strategy is being framed;
- developing and distributing an "Energy in Manitoba" brochure to create a greater awareness of energy and energy related issues.

Expenditures by Sub-Appropriation

23-2B Energy Planning	Actual 1990/91 $	Estimate 1990/91 SY	Estimate 1990/91 $	Variance Over(Under)
Total Salaries	330,200	8.00	383,900	(53,700)
Total Other Expenditures	99,300		96,700	2,600
Total Expenditures	429,500	8.00	480,600	(51,100)

Energy Programs (Buildings) Branch

The Energy Programs (Buildings) Branch is responsible for the promotion of energy conservation and energy efficient technologies in the building sector. Activities are directed to the residential, institutional, commercial and industrial sectors with a goal to helping Manitobans reduce their energy use and costs. This is accomplished through:

Manitoba Energy Audit Program

This program promotes effective energy use in industrial, commercial, institutional and agricultural facilities. Energy audits of more than 1800 Manitoba industries, businesses, institutions, and community based organizations have been completed since the program was initiated in 1980. More than $23.5 million in potential annual energy savings have been identified.

Two computer equipped audit vehicles (Energy Buses) provide complete on-site service. Program engineers and technologists inspect and analyze the operation and energy use, identify potential savings, and report the results to clients who can then use this information to undertake cost-effective energy saving projects.

During the 1990/91 fiscal year, 117 facilities were audited with more then $1.5 million in potential annual energy savings identified.

The focus of the program has been redirected to public buildings, in line with the government's wish to demonstrate a leadership role by "getting its own house in order".

In the 1991/92 fiscal year, emphasis will be placed on audits of schools, health care facilities, municipal buildings, and other government buildings. As well, technical assistance will be provided to clients to help them to increase the number of energy saving retrofit measures undertaken and to obtain better data on the actual savings achieved. (This will result in fewer audits being conducted, but increased savings per audit. It is estimated that 100 audits will be done in 1991/92 with that number rising to 150 the following year.)

As part of the ongoing evaluation of the Energy Audit Program, questionnaires were sent to clients for whom audits were completed in 1988. The evaluation is based on an analysis of qualitative and quantitative data from energy bills and the costs of energy management measures. The report on the evaluation will be completed in April, 1991.

Continuing developments are being made to the audit software to improve the efficiency of the program. Notable new software development capabilities include automatic report generation, domestic hot water, weather data, heat recovery from compressors, and metric conversions.

Home CHEC-UP

The Home CHEC-UP Program helps homeowners conserve energy by providing impartial advice on home retrofits. Trained Energy Advisors conduct energy analyses of homes and provide homeowners with reports detailing energy conservation programs and recommended retrofit techniques. There is no charge to the homeowner for this service.

During 1990/91 audits of 4,000 homes were completed. The program is delivered by Manitoba Hydro but funded by the department.

Cut Home Energy Costs (CHEC) Loan Program

The CHEC Loan Program was terminated June 30, 1990.

Public Information

- Home Energy Savers Workshops are delivered throughout the province to inform homeowners on how to retrofit their homes. In fiscal 1990/91, 824 people participated in 40 workshops. Since the program began in 1986, 2,826 homeowners have participated in 160 workshops.
- The Building Advisory Service provides support to the Energy Information Centre for technical enquiries related to buildings.
- Home Retrofit booklets provide homeowners with objective information on retrofit techniques and offer a detailed guide for both contractors and homeowners.

Workshops and Seminars

Branch personnel assisted in the planning and delivery of the following:

- Builders' and Renovators' Workshops, organized by the Manitoba Home Builders' Association and the Canada Mortgage and Housing Corporation.
- The "Indoor Environment and the Quality of Indoor Life" seminars, organized by the Canadian Research Board (Manitoba Chapter).
- Industrial Electrical Efficiency Conference where a presentation on the Manitoba Government's industrial programs was given. An Energy Bus was on display and attendees of the conference had an opportunity to tour the vehicle and have staff explain the Energy Audit Program.
- Manitoba Health Organization's Annual Conference at which the Energy Audit Bus Program engineers gave out information on energy audits at the booth of the Task Force on Energy Management in Health Care Facilities.

MHBA Task Force on Energy Efficient Housing

- Chaired by the department, representatives from Manitoba Hydro, Centra Gas, Winnipeg Hydro, and the Manitoba Home Builders Association, are developing guidelines for the construction of energy efficient homes.
- This unique initiative ensures that consumers contacting members of the Task Force are given consistent information on how to construct a cost-effective, energy efficient home in Manitoba.
- The guidelines will be completed in 1991/92.

IPACE/Conservation and Renewable Energy Subcommittee

This subcommittee of the Interprovincial Advisory Committee on Energy serves as a liaison for the provinces, territories and Energy, Mines and Resources Canada on matters of energy technology, programs and energy information transfer.

Other Committees and Associations

The Branch also works closely with Energy, Mines and Resources Canada through the Energy Technology Advancement (BETA) Program with a view to joint initiatives and projects.

In addition, Branch staff works with industry in a variety of energy related associations dealing with heating systems, siding and windows, refrigeration and air conditioning, appliances and equipment, as well as building codes. These associations include:

- Energy Management Task Force on Commercial and Office Buildings
- Heating, Refrigeration and Air Conditioning Institute (HRAI)
- Siding and Window Dealers' Association of Canada (SAWDAC)
- Canadian Construction Research Board
- Canadian Standards Association (CSA) Energy Council
- Sustainable Development Working Group on Education

Energy Projects

The Branch supports a variety of projects demonstrating or promoting effective energy management techniques.

Ground Service Heat Pump Monitoring Project

- The Manitoba Research Council is monitoring the performance of three large scale ground source heat pumps in Manitoba at an industrial facility (fish hatchery), a commercial office building and at an institutional building (school).
- The $165,000 study is sponsored by Manitoba Energy and Mines ($25,000), Energy, Mines and Resources Canada ($50,000), Manitoba Hydro ($40,000), and the Canadian Electrical Association ($50,000).
- The final report will be completed in early 1991/92.

Field Study of Livestock Water Fountains

- The Prairie Agricultural Machinery Institute is comparing the field performance of electricity heated and energy-free livestock water fountains.
- The $65,400 study is sponsored by Manitoba Energy and Mines ($7,000), Energy, Mines and Resources Canada ($10,500), Manitoba Hydro ($6,000), Canadian Electrical Association ($25,000), the cattle industry ($10,900), and the Prairie Agricultural Machinery Institute ($6,000).
- The final report will be complete in early 1991/92.

CEA Demand Side Management Conference

- Assistance of $7500 was provided in late 1989/90 to the Canadian Electrical Association to support a western regional conference on electrical demand side management held in Winnipeg in May, 1990.

Energy Calendar 1991

- We assisted Energy, Mines and Resources Canada to develop a 1991 Energy Calendar. The artwork of Keri Sobkowich, Grade 10 student, Fisher Branch Collegiate, was chosen for the month of June.
- We distributed the calendars to all schools, daycare centres and libraries in Manitoba.

Expenditures by Sub-Appropriation

23-2C Energy Programs (Buildings)	Actual 1990/91 $	Estimate 1990/91 SY	Estimate 1990/91 $	Variance Over(Under)
Total Salaries	421,400	10.00	428,900	(7,500)
- Grants/Transfer Payments	850,000		802,000	48,000
- Other Expenditures	182,100		237,300	(55,200)
Total Other Expenditures	1,032,100		1,039,300	(7,200)
Total Expenditures	1,453,500	10.00	1,468,200	(14,700)

Energy Programs (Transportation) Branch

The Energy Programs (Transportation) Branch was created in 1990 to coordinate the development of transportation policies and programs within the context of sustainable development and to promote alternate fuel and transportation modes within the public and private sectors of Manitoba. The objectives of the branch are to reduce overall expenditures on non-indigenous transportation fuels, reduce fossil fuel usage and thereby reduce impacts on the environment.

The activities and accomplishments of the Energy Programs (Transportation) Branch are as follows:

MPIC Database Acquisition and Analysis

The database provides information on the age and efficiency (i.e., number of cylinders) of registered vehicles in Manitoba contributing to the department's petroleum shortage contingency planning as well as transportation planning.

Department Vehicle Fleet

An internal pilot program has been created to measure the effect of voluntary or behavioural restraint on fuel consumption. The results will be shared with other government departments and agencies.

The branch continues to analyze the effect on fuel consumption and atmospheric emissions, of replacing existing vehicles with comparable, efficient ones. The results of the analysis will be used to develop a pilot program for the department which could lead to government policy regarding the purchase of vehicles.

Pro-Trucker Program

Pro-Trucker, initiated in 1985, is a federal-provincial-industry funded program, promoting efficient use of energy in the Manitoba trucking industry. Creation of the branch resulted in more physical resources being devoted to the program.

Through the efforts of the branch, Pro-Trucker will direct more attention to owner-operators and smaller fleet drivers. The Manitoba Trucking Association is using the data collected to prepare a multi-year strategic plan.

Public Information Activities

Branch staff provides support to the Energy Information Centre on technical enquiries related to alternative energy issues such as wind, peat and solar energy as well as transportation.

Natural Gas Study

The Department and Centra Gas contracted Sypher:Mueller International (SMI) to study the technical and economic feasibility of a compressed natural gas (CNG) transportation operation in Manitoba. The study will look specifically at the possibility of operating the Winnipeg Transit System and/or the City of Brandon vehicle fleet on natural gas.

During fiscal 1991/92, study results will be discussed with stakeholders. Further natural gas vehicle initiatives will depend on the results of those discussions.

Ethanol Production Facility Study

The Biomass Energy Institute was contracted to study the ethanol production facility in Minnedosa, Manitoba.

During fiscal 1991/92, branch staff will analyse the study results to determine the economic viability of ethanol production in Manitoba's agricultural communities.

Expenditures by Sub-Appropriation

23-2E Energy Programs (Transportation)	Actual 1990/91 $	Estimate 1990/91 SY	Estimate 1990/91 $	Variance. Over(Under)
Total Salaries	117,500	3.00	145,100	(27,600)
Total Other Expenditures	83,000		171,300	(88,300)
Total Expenditures	200,500	3.00	316,400	(115,900)

Note: The Branch was established as a new initiative in 1990/91 and all planned projects were not implemented/completed.

Petroleum Branch

The Petroleum Branch oversees the exploration and development of Manitoba's crude oil and natural gas resources. Our goal is to facilitate development of our resources in a manner consistent with the principles of sustainable development. We ensure that exploration and development are undertaken in accordance with government policy and legislation.

The branch administers those provisions of The Mines Act, The Pipe Line Act and The Gas Storage and Allocation Act which govern the exploration, development, production, transportation, and storage of crude oil and natural gas. We are also responsible for The Oil and Gas Production Tax Act. In addition, we provide technical assistance to The Oil and Natural Gas Conservation Board.

Technical studies and reports that we undertake provide valuable assistance and encouragement for new exploration and development of our crude oil and natural gas resources. Technical information and professional advice is provided to both the petroleum industry and the general public.

The following initiatives were undertaken during 1990/91:

- Initial drafting of a new Oil and Gas Act to replace Parts II and III of the present Mines Act, The Pipe Line Act and The Gas Storage and Allocation Act. The proposed Oil and Gas Act will replace legislation largely unchanged in over 30 years.
- Enhancement of Manitoba's profile within the Western Canadian "Oil Patch". We want to make companies operating in the other western provinces more aware of opportunities in Manitoba. To do this we are presenting papers at technical conferences, developing a "Manitoba Seminar" for presentation in Calgary and participating at the Saskatchewan Oil Show in Weyburn. We are also exploring the prospects of attracting investment in the Manitoba oil industry from neighbouring states in the United States.
- Implementation of amendments to the current oil royalty and production tax regulations to give horizontal wells and drains special royalty and tax treatment. These incentives, announced in September, 1990, are designed to generate activity using these new technologies.
- Review of Manitoba's royalty and production tax structures. The current Drilling Incentive and Enhanced Oil Recovery Incentive Programs are scheduled to expire January 1, 1992. Petroleum industry associations are being canvassed for comments on the current incentives.

The Petroleum Branch is made up of three sections: Administration, Geology, and Engineering and Inspection. The managers of the three report to the director of the Petroleum Branch.

Administration Section

Responsibilities of the Administration Section include:

- the administration of regulations under The Mines Act governing the disposition of Crown oil and natural gas rights;
- the collection of Crown oil and natural gas royalties;
- the collection of taxes on production from freehold oil and gas rights under The Oil and Gas Production Tax Act; and
- the administration of the Manitoba Drilling Incentive Program and the Enhanced Oil Recovery Incentive Program.

Petroleum Revenues

The Administration Section is responsible for the timely collection of petroleum revenues, and for conducting the twice yearly sale of Crown leases and exploration reservations. The section collects annual lease rentals, monthly Crown royalties and freehold oil taxes, and processes lease renewals and extensions. We are also responsible for the enforcement of other provisions under the Petroleum Crown Leasing Regulation and the Petroleum Crown Royalty and Incentives Regulation.

During 1990/91, $10.8 million in revenues were collected from the petroleum industry. These revenues comprise $2.8 million in Crown oil royalties, $7.7 million in oil production taxes and $0.3

million from Crown lease sales bonuses, rentals and fees. This represented an 11 per cent increase from 1989/90 and reflected increased oil prices related to the crisis in the Persian Gulf.

These figures exclude other provincial revenues from corporate capital tax, sales tax, municipal tax and corporate and individual income tax.

An Overview of Crown Lease and Exploration Reservation Sales

The Administration Section held two Crown oil and natural gas lease sales in 1990/91. Twenty leases covering 1 488 hectares were sold for a total of $116,650, down from 1989/90's lease revenue total of $240,548. Three exploration reservations covering 4 128 hectares were also sold during 1990/91 for a total of $55,641.

Lease sales in 1990/91 generated the lowest revenue since lease sales were re-implemented in 1979. Since 1978, the province has received $15,678,144 in revenue from the disposition of Crown leases and exploration reservations.

As of December 31, 1990, 30 081 hectares of Crown oil and natural gas rights were under disposition. Crown leases accounted for 23 841 hectares of this total (79 per cent) and exploration reservations for 6 240 hectares (21 per cent). Compared to 1989, the total area under disposition decreased by 11 per cent.

In addition to the 20 leases and three exploration reservations issued during 1990/91, we also processed 22 lease renewals, 8 lease extensions and 101 lease cancellations.

Data Collection

The section collects and publishes monthly oil production data and data on the disposal and the injection of salt water for all active wells in the province. A new improved format for the Monthly Production Statistics Report was introduced with the January, 1991 report. The section also proceeded with the microfilming of historical well production records. The 1990 Oil Activity Review was compiled and produced by this section.

Manitoba Drilling Incentive Program (1987-1991)

The current Manitoba Drilling Incentive Program runs from January 1, 1987 to December 31, 1991. Companies are exempt from payment of royalty or tax on a "holiday volume" of oil produced from qualifying new oil wells. The "holiday volume" varies for each well but cannot exceed a maximum of 10 000 cubic metres or five years of production, whichever is greater.

On December 31, 1990, there were 245 wells producing holiday oil volumes. The average volume earned per well has been 1 702 cubic metres.

One hundred and sixteen of the wells in the program have produced the holiday volume granted. Production from these wells is now classified as "new oil" for royalty and tax purposes.

Manitoba Drilling Incentive Program (1979-1987)

Twenty-two wells continue to produce under the Manitoba Drilling Incentive Program (1979-1987). These wells continued to qualify for special reduced Crown royalty/tax rates during 1990.

Enhanced Oil Recovery Incentive Program

The Enhanced Oil Recovery Incentive Program is designed to maximize oil recovery by encouraging enhanced oil recovery (EOR) projects.

Wells in new or enlarged EOR projects approved after January 1, 1987, and fully implemented prior to January 1, 1992, are eligible for an incentive period of up to 60 months. During this period, the operators benefit from reduced Crown royalty and tax rates on production from the projects.

Five enhanced oil recovery projects involving 77 tracts have received incentive periods under the program. One new project qualified under the program in 1990/91.

Geology Section

The Geology Section prepares reports on Manitoba's petroleum geology and hydrocarbon potential to encourage and assist in the exploration and development of the province's petroleum

resources. It also administers the Petroleum Geophysical Regulation.

A major initiative this year was the commencement of a new oil and gas well database. A good deal of work has been done on the structuring of the database. The geological formation data for some 350 existing wells and 93 new wells was verified during 1990/91.

A system is maintained for the designation of field and pool boundaries. As of December, 1990, Manitoba had 13 oil fields and 77 active designated pools. The section assigned field and pool codes to ninety-five new wells during 1990/91.

Engineering and Inspection Section

Engineering Component

- Under the authority of the Petroleum Drilling and Production Regulation the engineering component issues new drilling licences and processes applications to recomplete, suspend, or abandon wells. It also issues permits for all field processing facilities. In 1990/91, a total of 83 drilling licences were issued. One hundred and forty-four other technical applications related to wells were processed. In addition, 113 applications related to oil and gas facilities were processed.
- The engineering component provides technical support to The Oil and Natural Gas Conservation Board in processing applications related to well spacing, off-target drilling, production allowables, salt water disposal, pressure maintenance, gas conservation, and unitization. Thirteen such applications were reviewed in 1990/91.
- Technical studies are undertaken of oil and gas reserves and enhanced recovery potential. Information and advice are provided to the petroleum industry and the public.
- During 1990/91, Universal Well Identifier (UWI) coding for all wells in Manitoba was developed. This project allows for standardized referencing of Manitoba wells with the other western jurisdictions. The component also proceeded with a major microfilming project of technical well files on the more than 4000 wells.

Inspection Component

- The inspection component enforces regulations under The Mines Act related to geophysical surveys, drilling, production and pipeline operations. Specifically, the inspectors license and inspect field facilities, investigate complaints, witness specific operations, and interpret and communicate departmental or regulatory requirements to industry personnel. Each of the more than 2250 production related facilities in the province were inspected at least once during the year. District offices of the inspection component are located in Virden and Waskada.
- Before a well licence is released from performance deposit requirements, a number of conditions must be met. The inspection component visits all abandoned wellsites to ensure that the abandonment and clean up have been done properly and that plant growth has been established. During 1990/91, 77 wells were issued a Certificate of Abandonment, allowing for the release of the well from performance deposit requirements.
- The inspection component also manages a program of environmental protection involving the reclamation of all oil or salt water spill sites. Eighty-nine spill sites were inspected during 1990/91. A study of abandoned salt water disposal pits from the early days of oil development in Manitoba was also undertaken.

Petroleum Industry 1990 Overview

New Wells Drilled:	79
Oil Produced:	737 763 m^3 (4,643,000 bbls)
Value of Oil Sales:	$114,805,000
Average Oil Price:	$155.85/$m^3$ ($24.75/bbl)
Wells Produced - Dec., 1990:	1,430
Estimated Industry Expenditures:	$76 million

More comprehensive information and historical statistics on Manitoba's petroleum industry is presented in the "1990 Oil Activity Review". This publication is available from the Petroleum Branch and the Energy Information Centre.

Expenditures by Sub-Appropriation

23-2D Petroleum	Actual 1990/91 $	Estimate 1990/91 SY	Estimate 1990/91 $	Variance Over(Under)
Total Salaries	739,800	20.00	765,800	(26,000)
Total Other Expenditures	138,800		143,900	(5,100)
Total Expenditures	878,600	20.00	909,700	(31,100)

Oil and Natural Gas Conservation Board

The Oil and Natural Gas Conservation Board is established under The Mines Act. It has powers to inquire into all matters related to the drilling, production, storage, and transportation of oil and natural gas in Manitoba. The board may conduct hearings and may make orders as specified under The Mines Act.

No hearings were conducted by the board in 1990/91.

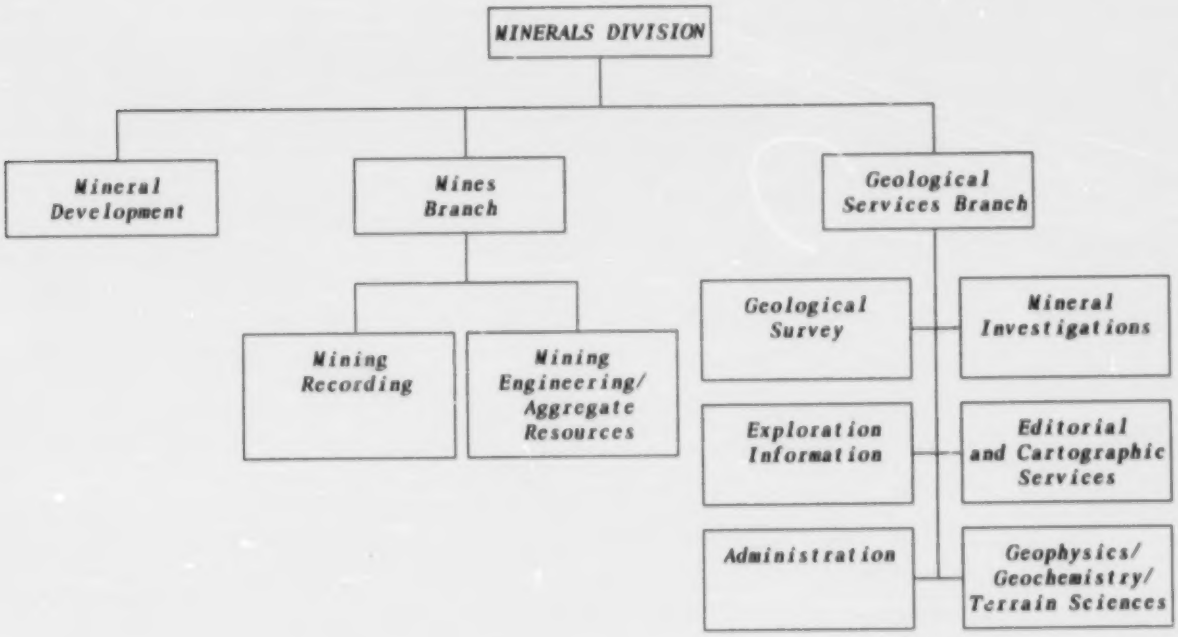
The board received 14 applications and issued 10 orders and granted approvals to 5 other applications in 1990/91.

MINERALS DIVISION

The Minerals Division develops, implements, and manages plans and programs relating to the exploration, development, and production of the province's metallic and non-metallic mineral resources. The division's goal is to encourage the development of these resources in a way that provides maximum benefits to Manitoba with due regard to protection of the environment.

Minerals Division Organization

The Division comprises the Mineral Development Section and two branches, the Mines Branch and the Geological Services Branch.



Mineral Development Section

Information gathering, analysis and promotion of new developments are the principal functions of the Mineral Development Section. Economic and financial analyses and marketing studies provide valuable information that is used to promote opportunities for mineral resources development in our province. The Section also monitors provincial, national, and international mineral developments, and provides analysis and evaluation of the economic impact of these developments on Manitoba. As part of its monitoring of current industry trends and changing technologies, the section collects and analyzes provincial mineral statistics. In addition, the section assists in reviewing and developing mineral royalty and taxation policies.

Expenditures by Sub-Appropriation

23-3A Mineral Development	Actual 1990/91 $	Estimate 1990/91 SY	Estimate 1990/91 $	Variance Over(Under)
Total Salaries	194,400	4.00	197,600	(3,200)
Total Other Expenditures	42,700		44,900	(2,200)
Total Expenditures	237,100	4.00	242,500	(5,400)

Mines Branch

The principal responsibility of the Mines Branch is the administration of The Mines Act and regulations governing the disposition of mineral rights; the exploration, development, and production of the province's mineral resources (other than oil and gas); and the rehabilitation of mines and quarries. Specific activities include:

- the recording (registration) of mineral dispositions (permits, claims, and leases);
- rehabilitation of mineral depleted mining lands;
- an inventory of the province's aggregate resources; and
- implementation of provincial land-use policy dealing with the conservation of aggregate resources.

The branch comprises two sections: Mining Recording and Mining Engineering/ Aggregate Resources. The section heads report to the director of the Mines Branch.

Mining Recording

The Mining Recording Section supports mineral development in the province through accurate record keeping and administration of regulations under The Mines Act. Offices are located in Winnipeg, The Pas, and Flin Flon.

The Mining Recording Section maintains up-to-date records of mineral dispositions and all legal transactions relating to mineral dispositions as required by legislation. The general public can access the mining recording computer database on mineral dispositions through terminals in each of the three recording offices. These facilities are used extensively by holders of mineral dispositions, departmental staff, and the general public.

Staff in the three recording offices processed applications for mineral dispositions; monitored and inspected the activities of disposition holders for compliance with the regulations; and collected fees, rentals, royalties, rehabilitation charges, and cash security deposits payable under the regulations.

During 1990, staff recorded 667 mining claims covering a total area of 130 105 hectares. Last year, claims covering 184 723 hectares were recorded. Page 27 shows the number and area of mineral dispositions in good standing at the end of 1990. Details of the types of Crown mineral dispositions issued in 1990 are shown on page 28.

Total revenue collected by the Branch during the fiscal year amounted to $2,342,800.

Mineral Dispositions in Good Standing

at calendar year end 1987 to 1990

	1987		1988		1989		1990	
	No.	Hectares	No.	Hectares	No.	Hectares	No.	Hectares
Mining								
Mining Claims	6 965	963 697	7 624	1 132 422	8 102	1 128 568	7 423	993 820
Order-in-Council Leases	4 184	119 382	4 184	119 382	3 661	120 674	4 032	127 692
Permits	24	395 357	13	324 495	10	218 874	14	384 993
Explored Area Leases	37	14 008	39	14 994	39	15 316	39	15 316
Production Leases	25	12 612	25	12 612	25	12 612	25	12 612
Miscellaneous Mineral Leases	1	403	1	403	1	403	1	403
Special Permit	-	-	1	156 876	3	348 496	4	742 858
Former Order in Council Leases					523	10 058	152	3 040
Leases Applied For					12	4 529	12	4 529
Potash								
Permits	1	7 699	-	-	-	-	-	-
Leases	1	5 791	1	5 787	1	5 787	1	5 787
Quarrying								
Leases	473	13 675	512	15 636	517	39 949	564	54 361
Exploration Permits	11	1 955	16	3 294	21	10 763	32	17 666
Limestone Exploration Permits	-	-	-	-	-	-	-	-
Peat								
Leases	36	5 030	36	5 029	38	13 179	38	13 179
Exploration Permits	2	465	1	269	-	-	-	-
TOTAL	11 760	1 540 074	12 453	1 791 199	12 953	1 929 208	12 337	2 376 256

*Area of Lease reduced.

Mineral Dispositions Issued

each calendar year 1987 to 1990

	1987		1988		1989		1990	
	No.	Hectares	No.	Hectares	No.	Hectares	No.	Hectares
Mining								
Mining Claims	1 075	212 139	1 731	341 772	948	184 723	667	130 105
Permits	13	203 279	8	182 710	8	159 253	7	218 824
Explored Area Leases	-	-	-	-	-	375	-	-
Production Leases	-	-	-	-	-	-	-	-
Miscellaneous								
Mineral Leases	-	-	-	-	-	-	-	-
Special Permit	-	-	1	156 876	3	348 496	1	394 362
Quarrying								
Leases	46	1 231	56	2 433	35	4 050	37	3962
Exploration Permits	5	1 533	10	2 848	7	2 863	15	7 496
Casual Permits	99	-	86	-	88	-	104	-
Permissions to Remove	629	-	628	-	595	-	600	-
Peat								
Leases	6	877	-	-	2	750	-	-
Exploration Permits	2	630	-	-	-	-	-	-

A decrease in revenue of approximately $212,700 was due to the general downturn in the economy and affected quarry minerals in particular.

Mining Engineering

The first objective of the Mining Engineering Section is to encourage sound mining and rehabilitation practices in Manitoba's mining industry. The second is to monitor mining activities to ensure compliance with The Mines Act and Regulations.

Staff made regular visits to the underground mines in the province to monitor their operations and conducted 2,250 inspections of pits and quarries to monitor compliance with The Mines Act and Regulations. The latter included both private and Crown operations. The section also provided technical advice about good mining and rehabilitation practices to the industry and other branches of government. The annual census of pits and quarries was administered on behalf of Energy, Mines and Resources Canada.

The section reviewed all Crown land transfers, subdivision and development plans, and zoning by-law amendments which were proposed during the year. Where necessary, staff made appropriate technical recommendations to minimize potential conflicts with mineral extraction.

The Branch was also represented on a variety of committees dealing with such concerns as land use conflicts, Native land claims, and environmental issues. Some of the committees include members of the mining industry and officials of federal and provincial government departments. Section staff contributed to interdepartmental committees concerning the Shoal Lake water management strategy, the municipal taxation of aggregate, and various land use issues. We also provided representation on the Technical and Management Committees of the national Mine Environment Neutral Drainage program (MEND).

The chief mining engineer was a judge at the 1990 Provincial Mine Rescue Competition held in Leaf Rapids.

A considerable amount of staff time was devoted to the drafting and revision of the proposed Mines and Minerals and Consequential Amendments Act. This work was largely completed by year end, and preparation of regulations under the proposed Act is now proceeding.

Aggregate Resources

The Aggregate Resources Section undertakes detailed surficial geological mapping, maintains aggregate resource inventories, and prepares quarry mineral land-use recommendations based on provincial land-use policies. Aggregate resource data and resource management proposals are provided to government, municipalities, and private sector users.

Staff geologists conducted economic evaluations of sand and gravel deposits in the Rural Municipalities of Boulton, Hillsburg, Pembina, Riverside and Strathcona and the Local Government District of Piney.

In response to requests from Municipal Planning Districts, staff compiled data on quarry mineral resources, which will be used by the Planning Districts to plan for the protection of the quarry mineral resources.

During the year the section released one geological report and eight more were in preparation.

Scheduled for the fiscal year 1991/92, are economic evaluations of sand and gravel deposits in three municipalities.

Expenditures by Sub-Appropriation

23-3B Mines	Actual 1990/91 $	Estimate 1990/91 SY	Estimate 1990/91 $	Variance Over(Under)
Total Salaries	1,345,000	34.26	1,376,100	(31,100)
Total Other Expenditures	574,700		603,000	(28,300)
Total Expenditures	1,919,700	34.26	1,979,100	(59,400)

Geological Services Branch

Objectives and Structure

The Geological Services Branch generates authoritative information on the geology of Manitoba in order to encourage and guide mineral exploration in the province. In addition, this information provides a data base for developing mineral policy, and for determining effective land-use policies. We make this information available through published maps, reports, displays, field demonstrations and presentations at scientific and industry-oriented meetings.

The Geological Services Branch was reorganized early in 1990 to better reflect the important role played in supporting new mineral initiatives and increased exploration by the private sector. Promotional and information services previously provided by the Exploration Services Section, Mines Branch, were transferred to the Geological Services Branch, which now contains six sections; Geological Survey, Minerals Investigations, Exploration Information, Editorial and Cartographic Services, Geophysics/Geochemistry/Terrain Sciences, and an Administrative component. The Analytical Laboratory now reports through the newly reconstituted Mineral Investigations section. The Editorial and Cartographic Section provides editing, graphics, cartographic, printing and publishing services for the Geological Services, Mines and Petroleum branches. All sections report to the branch director.

Activities

Regional offices in The Pas and Flin Flon continued to be active in providing support to local prospectors, and in retrieving core from various industry drilling operations. Late in the fiscal year we obtained clearance to establish a new core storage facility closer to Flin Flon, at the old Centennial minesite. Plans to expand the department's presence in northern Manitoba (as part of a broader decentralization initiative) are well advanced with the likelihood that a new office will be opened in Thompson during the 1991/92 fiscal year.

Over the last two decades, our field programs have been coordinated, with contributions from the Geological Survey of Canada, through Federal/Provincial Development Agreements. The jointly delivered programs have been targeted at areas with development potential, and regions where existing reserves are being depleted. Industry representatives provide input to program design through liaison committees.

During 1990/1991, delays in setting federal priorities for economic development in western Canada, postponed renewal of the Mineral Development Agreement (MDA) for the period 1990-1995. Accordingly, our provincial program was mounted at a maintenance level, with expenditures significantly below those of previous years. Despite problems related to the absence of an MDA, the year proved fruitful, with publication of many new reports stemming from the 1984-1989 MDA. We also made good progress in completing non-MDA work also undertaken during the 1984-1989 period.

Two evaluations of Branch programs were undertaken during 1990. Goss Gilroy and Associates were commissioned by Energy Mines and Resources Canada to report on effectiveness of the 1984-1989 MDA. The Goss Gilroy report concluded that the MDA clearly fulfilled the purpose and intent of the agreement in coordinating Canada's and Manitoba's existing mineral policies, programs and activities, while at the same time providing industry with support unlikely without an MDA. An evaluation of the Branch by GEOTECHnical resources ltd. noted a high degree of client acceptance for the services and outputs of the Branch, but recommended several changes to the internal workings of the organization to improve its' overall effectiveness. In response to these recommendations a start has been made in phasing in a number of new management practises to streamline and increase accountability of staff.

An important component of the 1990 summer field activities was to evaluate the opportunity for mapping areas affected by the severe forest fires in 1989, particularly the central portion of the Flin Flon-Snow Lake region, and the English Lake area in southeastern Manitoba. Branch staff also led or assisted in several field workshops designed to familiarize industry, university and other government geologists with key exploration and research areas, and with new concepts to guide exploration.

A full account of the branch's field surveys and investigations is contained in the Report of Activities released in November 1990 at the annual Meeting With Industry. Publications issued by the branch are listed at the end of this report.

Throughout the year branch staff provided advice and consultation to other government departments, and to Crown Corporations such as Manitoba Hydro. We also gave presentations on commodity prospects to various industry representatives, most notably to the Metal Mining Agency of Japan Fact Finding Mission on Rare Metals (September 19,20). Technical presentations on aspects of the province's development potential, and geological attributes, were given in Winnipeg, Vancouver, Calgary, Regina, Toronto, Hibbings and Dallas. We continued work on the Geological Atlas of the Western Canada Sedimentary Basin, a project coordinated by the Alberta Research Council.

In addition to the numerous reports and maps published, and displays prepared for outreach programs, the most significant products of the Editorial and Cartographic Section include:

- multicoloured bedrock compilation maps of Big Sand Lake and Winnipeg areas
- mineral deposit thematic map of the Agassiz Metallotect
- displays for
  - 47th Annual Mines Ministers Conference
  - 22nd Annual Meeting with Industry
  - CIMM-GSB joint meeting
  - CIM District 4 Annual Meeting
  - Prospectors and Developers Meeting

The Exploration Information Section provided support to the mining and exploration industry by monitoring, and promoting mineral exploration in the province, and by gathering and distributing nonconfidential exploration data. Drill core library inventory increased by 5 313 metres from 69 core holes.

Other activities are summarized below:

Visits to office by mining company personal	220
Reports of exploration received	187
Exploration reports assessed	176
Reports reproduced for mining companies	640
Reports examined by mining company personal	1034

New Initiatives

Negotiations to renew the Mineral Development Agreement for the period 1990-1995 were close to completion by year-end, with the likelihood that MDA activities would commence in April 1991. The principal priorities of the new Agreement will be to assist the search for new copper and zinc deposits in the region feeding the Flin Flon smelter, and new nickel deposits along the southwest extension of the Thompson belt. Efforts will also be made to attract increased exploration in the region northeast of Lake Winnipeg, and to strengthen and diversify industrial mineral developments in the southern sector of the province. Research related to rehabilitation of mine tailings, will also be undertaken as part of the province's contribution to the national Mine Environment Neutral Drainage (MEND) program.

In 1990, we began a co-operative federal-provincial EXTECH (Exploration Science and Technology) project in the Snow Lake area. The program is designed to assist industry by devising new exploration methods and equipment, and by generating new insights into the genesis of mineral deposits.

Negotiations between the Geological Survey of Canada, Manitoba Energy and Mines and Saskatchewan Mineral Resources to begin a National Mapping (NATMAP) initiative have resulted in a proposal to begin a five year joint program in the Flin Flon and southern Kisseynew belts commencing in the 1991 field season. The project will result in increased federal government activity and expenditures in the project area. Compilations of geology, surficial deposits and sub-Phanerozoic basement geology at 1:100 000 scale will

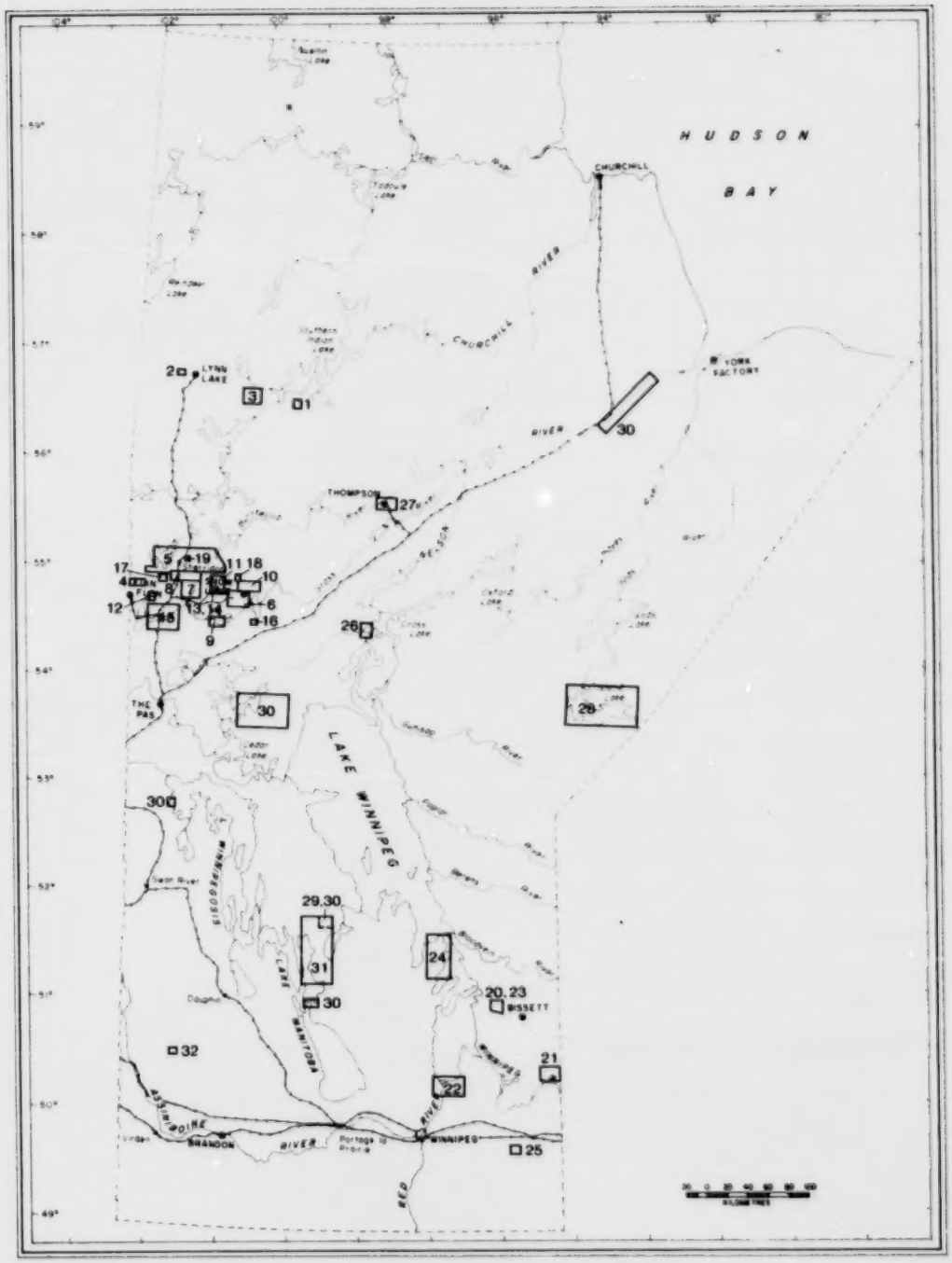
be produced. The project will also act as a catalyst to significantly enhance the dissemination of information and level of knowledge of these two mineral belts. This will increase the profile of this area in the geological community in general and the mining community specifically.

We also provided recommendations in the planning of the proposed LITHOPROBE Trans-Hudson-Orogen-Transect project. This multi-million dollar, three-year, federally-funded, national initiative will provide new information on the structure of the upper crust in northern Manitoba and Saskatchewan, together with innovative concepts that may aid industry in its search for new mineral deposits.

Expenditures by Sub-Appropriation

23-3C Geological Services	Actual 1990/91 $	Estimate 1990/91 SY	Estimate 1990/91 $	Variance Over(Under)
Total Salaries	2,973,600	80.22	3,079,100	(105,500)
Other Expenditures	724,000		724,500	(500)
Total Expenditures	3,697,600	80.22	3,803,600	(106,000)

Location Of Field Projects, 1990/91



Location Of Field Projects, 1990/91

MAP LEGEND

Lynn Lake District

1 Geochemistry of volcanic and intrusive rocks, Ruttan Mine area

2 Lynn Lake Rhyolitic Complex

3 REE investigations, Eden Lake Intrusive Suite

Flin Flon District

4 Geological mapping, Tartan Lake-Embury Lake area

5 Kisseynew project

6 Chisel-Anderson project

7 Elbow Lake project

8 Webb Lake-Fay Lake

9 Spruce Point Cu-Zn deposit

10 Rod and Bee Zone Cu-Zn deposits

11 Regional till investigations, Snow Lake area

12 Base metal mineralization, Baker Patton Felsic Complex

13 Mineral investigations, North Star Lake area

14 Gold occurrences, North Star Lake area

15 Mineral occurrences, Flin Flon area

16 Copper-Man base metal deposit

17 Mineral investigations, Lobstick Narrows and Elbow Lake

18 Mineral investigations, Squall Lake area

19 Base metal potential, Sherridon area

Southeast Manitoba

20 Geological mapping, English Brook area

21 Vegetation geochemistry, Tanco Pegmatite, Bernic Lake

22 Transgressive Barrier Islands, Red River Delta

23 Mafic - ultramafic intrusions, English Lake area

24 Peat resources, Washow Bay area

25 Building stone, Medika area

Thompson-Cross Lake District

26 Cross Lake supracrustal investigations

27 Iron formation at the 1A pit, Thompson Mine

28 Mineral occurrences, Island Lake area

Manitoba General

29 Karst landforms in the Gypsum Lake area

30 Stratigraphic mapping and core hole program 1990

31 Industrial minerals, Gypsumville-Steep Rock area

32 Geology and hydrogeology of tills, Rossburn

Appendix A - Financial Information

Table 1

Energy and Mines Expenditure Summary

for fiscal year ended March 31, 1991
with comparative figures for the previous fiscal year

Estimate 1990/91		Appropriation	Actual 1990/91	Actual 1989/90	Increase (Decrease)	Expl. No.
	23-1	Administration and Finance				
20,600		(a) Minister's Salary	20,600	20,600		
		(b) Executive Branch				
325,100		Salaries	335,800	376,400	(40,600)	
151,100		Other Expenditures	161,900	141,100	20,800	
		(c) Administrative Services				
668,700		Salaries	621,300	610,900	10,400	
542,900		Other Expenditures	656,300	599,300	57,000	
1,708,400	Total 23-1		1,795,900	1,748,300	47,600	
	23-2	Energy				
		(a) Energy Administration				
227,800		Salaries	206,000	214,100	(8,100)	
83,000		Other Expenditures	76,900	64,700	12,200	
		(b) Energy Planning				
383,900		Salaries	330,200	385,700	(55,500)	
96,700		Other Expenditures	99,300	54,500	44,800	
		(c) Energy Programs (Buildings)				
428,900		Salaries	421,400	522,300	(100,900)	
1,039,300		Other Expenditures	1,032,100	1,063,700	(31,600)	
		(d) Petroleum				
765,800		Salaries	739,800	718,200	21,600	
143,900		Other Expenditures	138,800	133,900	4,900	
		(e) Energy Programs (Transportation)				
145,100		Salaries	117,500	0	117,500	1
171,300		Other Expenditures	83,000	0	83,000	1
3,485,700	Total 23-2		3,245,000	3,157,100	87,900	

Estimate 1990/91		Appropriation	Actual 1990/91	Actual 1989/90	Increase (Decrease)	Expl. No.
	23-3	Mineral Resources				
		(a) Mineral Development				
197,600		Salaries	194,400	176,500	17,900	
44,900		Other Expenditures	42,700	33,400	9,300	
		(b) Mines				
1,376,100		Salaries	1,345,000	1,321,700	23,300	
603,000		Other Expenditures	574,700	606,200	(31,500)	
		(c) Geological Services				
3,079,100		Salaries	2,973,600	2,417,500	556,100	2
724,500		Other Expenditures	724,000	273,500	450,500	2
		(d) Canada/Manitoba Mineral Development				
		Salaries	0	566,000	(566,000)	3
		Other Expenditures	0	1,053,700	(1,053,700)	3
6,025,200	Total 23-3		5,854,400	6,448,500	(594,100)	
3,400,000	23-4	Manitoba Energy Authority	3,053,300	2,048,100	1,005,200	4
14,619,300	**TOTAL EXPENDITURES**		**13,948,600**	**13,402,000**	**546,600**	

Explanation Number:

1 Energy Programs (Transportation) were a new initiative in 1990/91.

2 Bridge funding was provided until new Mineral Development Agreement is signed.

3 Expiration of the 1984-1989 Mineral Development Agreement.

4 Increase in costs for Manitoba Energy Authority is related to Dow Corning contract.

NOTE: Due to the early printing of the Annual Report, some of the 1990/91 Expenditure figures may not be final.

Table 2

Energy and Mines Revenue Summary by Source

for the year ended March 31, 1991
with comparative figures for the previous fiscal year

Actual 1989-1990	Actual 1990-1991	Increase (Decrease)	Expl. No.	Source	1990-1991 Actual	1990-1991 Estimate	Variance	Expl. No.
				Current Operating Programs:				
				Taxation:				
6,889,800	7,735,300	845,500		Oil and Natural Gas Production Tax	7,735,300	7,829,600	(94,300)	
6,889,800	7,735,300	845,500	1	Total	7,735,300	7,829,600	(94,300)	
				Other Revenue:				
				(a) Petroleum				
162,100	187,300	25,200		Application Fees, Rentals, Etc.	187,300	254,600	(67,300)	
231,900	112,000	(119,900)		Oil & Nat. Gas Lease Bonus	112,000	200,000	(88,000)	
2,455,800	2,788,900	333,100		Oil & Nat. Gas Lease Royalties	2,788,900	2,769,200	19,700	
2,849,800	3,088,200	238,400		Total	3,088,200	3,223,800	(135,600)	
				(b) Mines				
1,833,900	1,838,300	4,400		Dispositions, Fees, Rentals, etc	1,838,300	1,701,100	137,200	
721,600	504,500	(217,100)		Royalties (Industrial Mineral Production)	504,500	693,000	(188,500)	
2,555,500	2,342,800	(212,700)		Total	2,342,800	2,394,100	(51,300)	

Actual 1989-1990	Actual 1990-1991	Increase (Decrease)	Expl. No.	Source	1990-1991 Actual	1990-1991 Estimate	Variance	Expl. No.
				(c) Sundry Revenue				
16,000	16,800	800		Publications, Etc.	16,800	22,500	(5,700)	
1,000	16,200	15,200		Other	16,200	16,800	(600)	
17,000	33,000	16,000	2	Total	33,000	39,300	(6,300)	
12,312,100	13,199,300	887,200		Total Revenue	13,199,300	13,486,800	(287,500)	

Explanatory Comments Regarding Revenue Increases(Decreases) and Variances:

1 Increase is a result of higher oil prices in 1990/91.

2 Sundry Revenue increased due to recovery from sale of department-owned vehicles.

NOTE: Due to the early printing of the Annual Report, some of the 1990/91 Revenue figures may not be final.

Table 3

Energy and Mines Other Revenue Collected by the Province

for the year ended March 31, 1991
with comparative figures for the previous fiscal year

Actual 1989-1990	Actual 1990-1991	Increase (Decrease)	Source	1990-1991 Actual	1990-1991 Estimate	Variance
119,057,400	50,245,500	(68,811,900)	Mining Tax - Finance	50,245,500	43,500,000	6,745,500
71,200	82,400	11,200	Mining Claim Lease Tax - Finance	82,400	76,500	5,900
119,128,600	**50,327,900**	**(68,800,700)**	**Total Other Revenue**	**50,327,900**	**43,576,500**	**6,751,400**

Table 4

Energy and Mines Five Year Expenditure and Staffing Summary by Appropriation ($000)

for years ending March 31, 1987 - March 31, 1991

Main Appropriation	Actual Expenditures 1986/87 SY	1986/87 $	1987/88 SY	1987/88 $	1988/89 SY	1988/89 $	1989/90 SY	1989/90 $	1990/91 SY	1990/91 $
Administration & Finance	28:20	2,676,000	27:19	2,015,600	28:12	2,098,100	26:50	1,745,300	25:22	1,795,900
Energy	51:46	4,988,600	49:04	14,156,400	50:36	2,701,100	44:28	3,160,100	43:36	3,245,000
Mineral Resources	116:51	6,569,300	121:28	6,669,100	117:29	7,042,000	120:29	6,448,500	109:46	5,854,400
Manitoba Energy Authority				1,672,100	-	1,667,100	-	2,048,100	-	3,053,300
Capital		83,300								
Total	**197.13**	**14,317,200**	**197.51**	**24,513,200**	**196:25**	**13,508,300**	**192:03**	**13,402,000**	**179:00**	**13,948,600**

Appendix B

Department Publications

Manitoba

GEOLOGICAL REPORTS

Bedrock Geology Compilation Map 64G	Big Sand Lake NTS 64G,1:250 000 with marginal notes - Manitoba Energy and Mines, Geological Services
Bedrock Geology Compilation Map 62H	Winnipeg, NTS 62H, 1:250 000 with marginal notes - Manitoba Energy and Mines, Geological Services
Geological Paper GP87-1	Quaternary stratigraphy and overburden geochemistry in the Phanerozoic terrane of southern Manitoba - Nielsen, E.
Geological Paper GP90-1	Karst landforms in the Gypsum Lake area; character and distribution - McRitchie, W.D. and Voitovici, P.
Geological Report GR85-1	Geology of the lower Churchill River region - Corkery, M.T. and Lenton, P.G.
Geological Report GR82-3	The Fox River Sill, northeastern Manitoba - a major stratiform intrusion - Scoates, R.F.J.
Mineral Deposit Series Report No. 12	Mineral deposits and occurrences in the Saw Lake area, NTS 63J/14 - Fedikow, M.A.F. and Ferreira, K.J.
Mineral Deposit Series Report No. 7	Mineral deposits and occurrences in the Tramping Lake area, NTS 63K/9 - Ferreira, K.J. and Fedikow, M.A.F.
Mineral Deposit Series Report No. 21	Mineral deposits and occurrences in the Buzz Lake area, NTS 63J/12 - Ferreira, K.J. and Fedikow, M.A.F.
Mineral Deposit Series Report No. 13	Mineral deposits and occurrences in the Duval Lake area, NTS 63N/4 - Ostry, G.
Mineral Deposit Series Report No. 15	Mineral deposits and occurrences in the Aikens Lake area, NTS 52M/3 - Theyer, P.
Mineral Deposit Series Report No. 10	Mineral deposits and occurrences in the Garner Lake area, NTS 52L/14 - Theyer, P. and Ferreira, K.J.
Mineral Deposit Thematic Map	The Agassiz Metallotect-a regional metallogenetic Series Map 89-1 concept Lynn Lake area - Fedikow, M.A.F., Parbery, D., and Ferreira, K.J.
Open File Report OF90-1	Index to non-confidential assessment reports - Esposito, B.

Open File OF90-2 — Metallic mines and mineral deposits of Manitoba
- Bamburak, J.D.

Report of Activities (1990)

Introductory review — - W.D. McRitchie

Lynn Lake District

GS-1 Major element and REE analyses for selected volcanic and intrusive rocks in the Ruttan Mine area (NTS 64B/5)
- Gale, G.H.

GS-2 Geology of the mafic rocks in the southern unit, Lynn Lake Rhyolitic Complex (NTS 64C/14)
- Young, J.

GS-3 REE investigations, Eden Lake Intrusive Suite (NTS 64C/9)
- Young, J. and McRitchie, W.D.

Flin Flon District

GS-4 Geological investigations in the Tartan Lake-Embury Lake area (NTS 63K/13)
- Gilbert, H.P.

GS-5 Kisseynew project: burn reconnaissance and review (NTS 63N/2 and 63N/3)
- Zwanzig, H.V.

GS-6 Chisel-Anderson project (NTS 63K/16SE)
- Bailes, A.H.

GS-7 Elbow Lake project (part of NTS 63K/15W)
- Syme, E.C.

GS-8 Webb Lake-Fay Lake (NTS 63K/15)
- Schledewitz, D.C.P.

GS-9 The geological setting and geochemical alteration of the Spruce Point Cu-Zn deposit, Snow Lake area, Manitoba (NTS 63K/9)
- Fedikow, M.A.F. and Lebedynski, A.

GS-10 The geological setting of the Rod Cu-Zn and Bee Zone Cu-Zn deposits, Snow Lake area, Manitoba (NTS 63J/13)
- Fedikow, M.A.F., Malis, C., Cooley, K. and Lebedynski, A.

GS-11 Regional till geochemical investigations in the Snow Lake area (NTS 63K/16, 63J/13 and 63J/12)
- Gobert, G.

GS-12 Geological setting of base metal mineralization in the Baker Patton Felsic Complex, Flin Flon area (NTS 63K/13)
- Norquay, L.I. and Gale, G.H.

GS-13 Mineral investigations in the North Star Lake area (NTS 63K/15)
- Trembath, G.D., Norquay, L.I. and Gale, G.H.

GS-14 Documentation of gold occurrences in the North Star Lake area (NTS 63K/15)
- Pippert, R. and Gale, G.H.

GS-15 Documentation of mineral occurrences in the Flin Flon area (NTS 63K/11, 12)
- Gale, G.H., Ostry, G. and Trembath, G.D.

GS-16 Geological setting of the Copper-Man base metal deposit, (NTS 63J/12)
- Trembath, G.D. and Fedikow, M.A.F.

GS-17 Mineral occurrence investigations in the Lobstick Narrows and Elbow Lake areas (NTS 63K/14, 63K/15)
- Parbery, D.

GS-18 Mineral investigations in the Squall Lake area (NTS 63K/16)
- Ostry, G.

GS-19 Investigation of base metal potential in the Sherridon area (NTS 63N/2)
- Ostry, G. and Bieri, M.

Southeast Manitoba District

GS-20 Geological investigations in the English Brook area, southeastern Manitoba (NTS 62P/1)
- Weber, W.

GS-21 Anomalous trace element concentrations in vegetation from the area of the Tanco Pegmatite, Bernic Lake, Manitoba (NTS 52L/5)
- Fedikow, M.A.F. and Dunn, C.

GS-22 Vertical sedimentary sequence and morphology in the transgressive Barrier Islands along the Red River Delta (NTS 62I/7)
- Nielsen, Erik.

GS-23 Geological setting of a mafic - ultramafic intrusion in the English Lake area, southeast Manitoba (NTS 62P/1)
- Young, J. and Theyer, P.

GS-24 Investigation of peat resources in the Washow Bay area (NTS 62P)
- Elias, P. and Schmidtke, B.

GS-25 Documentation of building stone resources in the Medika area (NTS 52E)
- Schmidtke, B. and Elias, P.

Thompson-Cross Lake District

GS-26 Cross Lake supracrustal investigations (part of NTS 63J/9)
- Corkery, M.T.

GS-27 Investigations of the 'iron formation' at the 1A pit, Thompson Mine (NTS 63P/13)
- Gale, G.H. and Fedikow, M.A.F.

GS-28 Mineral occurrence studies and documentation in the Island Lake area (NTS 53E)
- Theyer, P.

Manitoba General

GS-29 Karst landforms in the Gypsum Lake area; character and distribution (NTS 62O/16)
- McRitchie, W.D. and Voitovici, P.

GS-30 Stratigraphic mapping and core hole program 1990 (NTS 63G)
- Bezys, R.K.

GS-31 Industrial minerals investigations in the Gypsumville-Steep Rock area (NTS 62O)
- Gunter, R.

GS-32 Geology and hydrogeology of tills, Rossburn study site
- Betcher, B. and Nielsen, Erik

GS-33 Departmental geographic information systems
- Chackowsky, L.E.

GS-34 Manitoba's Precambrian drill core collection program: an update and review
- Prouse, D.E.

GS-35 Manitoba Mineral Inventory
- Athayde, P.

Geological Survey of Canada

GSC-1 Relationship of synvolcanic dykes to hydrothermal alteration in the Edwards Lake Formation, Chisel Lake area (NTS 63K/16)
- Galley, A.G. and Scoates, J.S.

GSC-2 Geological setting of the North Chisel Zn-Cu massive sulphide deposit (NTS 63K/16)
- Galley, A.G. and Kitzler, J.

GSC-3 Preliminary report on the geological setting of the Ruttan base metal deposit and associated hydrothermal alteration, Rusty Lake greenstone belt, Manitoba (NTS 64B/5)
- Ames, D.E., Scoates. J.S. and Franklin, J.M.

University Of Manitoba

UM-1 Mineralogical examination of two samples of gold-bearing quartz vein from the Rice Lake greenstone belt
- Healy, R.E.

PRELIMINARY GEOLOGICAL MAPS

Geological Services Branch
Geological Survey

1990S-1 Chisel-Morgan-Anderson (NTS 63K/16SE) 1: 20 000.
-Bailes, A.H.

1990S-2 Anderson Lake (parts of NTS 63K/16 and 63J/13) 1: 5 000.
-Bailes, A.H. and Galley, A.G.

1990M-1 Paleozoic geology of the Grand Rapids area (NTS 63G) 1: 250 000.
-Bezys, R.K.

1990M-2 Subsurface Precambrian structure of the Grand Rapids and Wekusko Lake map sheets (NTS 63G and 63J) 1: 250 000.
-McGregor, C.R., Bezys, R.K. and McCabe, H.R.

1990K-1 West Cross Lake (parts of NTS 63J/9SE and 63J/9NE) 1: 20 000.
-Corkery, M.T.

1990K-2 Webb Lake (NTS 63K/15) 1: 20 000
-Schledewitz, D.C.P.

1990F-1 Tartan-Embury Lakes (part of NTS 63K/13) 1: 20 000.
-Gilbert, H.P.

1990F-2 North Star Lake (NTS 63K/15) 1:5000.
-Trembath, G.D., Norquay, L.I. and Gale, G.H.

AGGREGATE RESOURCES REPORTS

Aggregate Report AR88-13	Sand and gravel resources in the Flin Flon-Cranberry Portage area -Groom, H.D.

PETROLEUM REPORTS

Isopach Map	Lower Amaranth, Southwestern Manitoba 1:125 000
Petroleum Open File Report POF 8-88	Regional geology and petroleum potential of the Bakken Formation, southwestern Manitoba -Martiniuk, C.D.
Petroleum Open File Report POF 9-88	Evaluation of the Daly field, Bakken Formation, southwestern Manitoba -Arbez, M.
Petroleum Open File Report POF 10-90	Evaluation of the lower Amaranth Formation in the South Pierson field, southwestern Manitoba. -Arbez, M.
Petroleum Open File Report POF 11-90	Regional geology and petroleum potential of the lower Amaranth Formation, Coulter-Pierson area, southwestern Manitoba. -Husain, M.

EXTERNAL PUBLICATIONS

Fedikow, M.A.F. and Amor, S.D.
1990: Evaluation of a mercury-vapour detection system in base- and precious-metal exploration, northern Manitoba; Journal of Geochemical Exploration, volume 38, p. 351-374.

Ferreira, K.J. and Fedikow, M.A.F.
1990: Specific conductance and hydrogen ion concentration as indicators of trace-element geochemical response in humus; Rod Cu-Zn and Big Island Zn-Cu-Au deposits, Manitoba (Canada); Journal of Geochemical Exploration, v. 37, no. 2, p. 185-203.

Galley, A.G., Bailes, A.H., Syme, E.C., Bleeker, W., Macek, J.J. and Gordon, T.M.
1990: Geology and ore deposits of the Early Proterozoic Flin Flon and Thompson belts, Manitoba; Fieldtrip Guidebook, The International Association of the Genesis of Ore Deposits; 8th Symposium, Ottawa, 1990, 136p.

Gordon, T.M., Hunt, P.A., Bailes, A.H. and Syme, E.C.
1990: U-Pb zircon ages from the Flin Flon and Kisseynew belts, Manitoba: Geochronology of crust formation at an Early Proterozoic accretionary margin; In The Early Proterozoic Trans-Hudson Orogen of North America (J.F. Lewry and M.R. Stauffer ed.), Geological Association of Canada, Special Paper 37, p. 177-199.

Halden, N.M., Clark, G.S., Corkery, M.T., Lenton P.G. and Schledewitz, D.C.P.

1990: Trace-element and Rb-Sr whole-rock isotopic constraints on the origin of the Chipewyan, Thorsteinson, and Baldock batholiths, Churchill Province, Manitoba; In The Early Proterozoic Trans-Hudson Orogen of North America (J.F. Lewry and M.R. Stauffer ed.), Geological Association of Canada, Special Paper 37, p. 201-214.

Hunt, P.A. and Zwanzig, H.V.

1990: Per-Missi granitoid domes in the Puffy Lake area, Kisseynew gneiss belt, Manitoba; In Radiogenic age and isotopic studies,Report 3; Geological Survey of Canada Paper 89-2, p. 71-76.

Machado, N., Krogh, T.E. and Weber, W.

1990: U-Pb geochronology of basement-gneisses in the Thompson Belt (Manitoba); evidence for pre-Kenoran and Pikwitonei-type crust and Early Proterozoic basement reactivation in the western margin of the Archean Superior Province; Canadian Journal of Earth Science 44p.

Syme, E.C.

1990: Stratigraphy and geochemistry of the Lynn Lake and Flin Flon metavolcanic belts, Manitoba; In The Early Proterozoic Trans-Hudson Orogen of North America (J.F. Lewry and M.R. Stauffer ed.), Geological Association of Canada, Special Paper 37, p. 143-161.

Weber, W.

1990: The Churchill-Superior boundary zone, southeast margin of the Trans-Hudson Orogen: A review; In The Early Proterozoic Trans-Hudson Orogen of North America (J.F. Lewry and M.R. Stauffer ed.), Geological Association of Canada, Special Paper 37, p. 41-55.

Weber, W. and Mezger, K.

1990: An oblique cross section of Archean continental crust at the northwestern margin of the Superior Province, Manitoba, Canada; In Exposed Cross Sections of Continental Crust (M.H. Salisbury and D.M. Fontain, ed), NATO Advanced Science Institute Series, Kluwer Academic Publishers (Netherlands), p. 327-341.

Zwanzig, H.V.

1990: Kisseynew gneiss belt in Manitoba: stratigraphy, structure, and tectonic evolution; In The Early Proterozoic Trans-Hudson Orogen of North America (J.F. Lewry and M.R. Stauffer ed.), Geological Association of Canada, Special Paper 37, p. 95-120.

MISCELLANEOUS

Annual Report, 1988-1989

Annual Report, 1989-1990

DEPARTMENTAL DIRECTORY*

Minister, Energy and Mines
301 Legislative Building
450 Broadway
Winnipeg, Manitoba R3C 0V8 945-4601

Deputy Minister, Energy and Mines
309 Legislative Building
450 Broadway
Winnipeg, Manitoba R3C 0V8 945-3130

ADMINISTRATIVE SERVICES	
Executive Director	945-3673
Computer Systems	945-2172
Financial Services	945-3673
Personnel Services	945-2818
Library	945-6569
ENERGY DIVISION	
Assistant Deputy Minister	945-3760
Energy Information Center	945-4154
Energy Planning	
Director	945-8427
Energy Programs (Buildings)	
Director	945-5745
Energy Programs (Transportation)	
Director	945-5005
Petroleum	
Director	945-6577
Administration	945-6571
Geology	945-6572
Engineering and Inspection	945-6574
Virden Office[1]	748-2208
Waskada Office[2]	673-2767
MINERALS DIVISION	
Mineral Development	945-6868
Mines	
Director	945-6503
Mining Recording	945-6532
The Pas Office[3]	623-6411
Flin Flon Office[4]	687-4222
Mining Engineering	945-6522
Dauphin Office[5]	638-9111
Geological Services	
Director	945-6567
Geological Surveys	945-6549
Mineral Investigations	945-6561
Flin Flon Office	687-4222
Editorial and Cartographic Services	945-6551
Analytical & Geochemical Laboratory[6]	945-3786
Exploration Information	945-6535

CORPORATIONS, BOARDS, COMMITTEES

Manitoba Energy Authority
12th Floor National Bank Building
191 Lombard Avenue
Winnipeg, Manitoba R3B 0X1 945-0193

Manitoba Mineral Resources
603 - 491 Portage Avenue
Winnipeg, Manitoba R3B 2E4 775-8041

Oil and Natural Gas Conservation Board
555 - 330 Graham Avenue
Winnipeg, Manitoba R3C 4E3 945-6577

Mining Board
555 - 330 Graham Avenue
Winnipeg, Manitoba R3C 4E3 945-6503

*Mailing address: Energy and Mines
555 - 330 Graham Avenue
Winnipeg, Manitoba R3C 4E3 unless otherwise indicated.

1 Energy and Mines
Petroleum Engineering and Inspection
Box 1359
Virden, Manitoba R0M 2C0

2 Energy and Mines
Petroleum Engineering and Inspection
Box 222
Waskada, Manitoba R0M 2E0

3 Energy and Mines
Mining Recording
Box 2550
The Pas, Manitoba R9A 1M4

4 Energy and Mines
The Barrow Provincial Building
143 Main Street
Flin Flon, Manitoba R9A 1T2

5 Energy and Mines
Mining Engineering
27 Second Street, S.W.
Dauphin, Manitoba R7N 3E5

6 Energy and Mines
Analytical and Geochemical Laboratory
745 Logan Avenue
Winnipeg, Manitoba R3E 1M8